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10/563,176	05/23/2006	Paul Royo	P-2597	3766

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EXAMINER	
PARK, KINAM	

ART UNIT	PAPER NUMBER
2828	

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08/14/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/563,176	ROYO, PAUL	
	Examiner	Art Unit	
	KINAM PARK	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 May 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Examiner acknowledges and accepts amendments made to the claims, filed on May 16, 2007:

Claims 1-31 are pending;

Claims 1 and 6-7 have been amended; and

Claims 30 and 31 have been added.

Response to Arguments

2. Applicant's arguments, filed on May 16, 2007, have been fully considered but they are not persuasive.

Applicant's arguments on pages 13-19,

1) pertaining to claim1, where applicant submits that Claim 1 is not anticipated by Shieh et al. The implants 42 disclosed in Shieh et al. are not adapted to generate increased optical losses of the resonator with respect to higher order modes, as claimed in claim 1. Shieh et al discloses the only function of the implants 42 is for preventing migration of defects and carriers. In Shieh et al, the portion 38 cannot be considered as forming in the aperture, as claimed in claim 1, because the diameter of the aperture formed by the portion 38 is clearly less than the diameter of the second mirror stack 37, or mesa, disclosed in Shieh et al. Claim 1 specifically recites that the second characteristic lateral size dm of the mesa is smaller than the first characteristic lateral size do× of the aperture. Accordingly, claim 1 cannot be anticipated by Shieh, et al.

However, it is the examiner's interpretation that Shieh et al. disclose in figure 2 and 3 that an aperture layer (42) located above said first plurality of doped layers (31) and formed of an insulating material that is substantially non-transparent for a specified wavelength range, the aperture layer having an aperture formed of conductive and optically transparent material with a first characteristic lateral size (d_{ox}) (see, figure 3 in the office action); thereby claim 1 can be anticipated by Shieh, et al.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1-3, 12-13 are rejected under 35 U.S.C. 102(b) as being anticipated by SHIEH et al. (EP 000772266).

Regarding **claim 1,**

SHIEH et al. discloses in figure 2, 3 and specification:

1. Vertical cavity surface emitting laser, which emits the fundamental transverse radiation mode only, comprising:

a laser active region (32) , a resonator having a first reflector (31) and a second reflector (37),

the first reflector comprising

a first plurality of doped layers (31) having alternately a low index of refraction and a high index of refraction,

an aperture layer (42) located above said first plurality of doped layers (31) and formed of an insulating material that is substantially non-transparent for a specified wavelength range, the aperture layer having an aperture formed of conductive and optically transparent material with a first characteristic lateral size (d_{ox}), and

a second plurality of doped layers (37) having alternately a low Index of refraction and a high Index of refraction (see, col. 3, lines 55-57), the second plurality having a second characteristic lateral size (d_m), a difference of the first characteristic lateral size (d_{ox}) (see, figure 2 and 3), and

the second characteristic lateral size (d_m) being smaller than (d_{ox}) (see, figure 2 and 3) and being adapted to generate increased optical losses of said resonator with 3respect to higher order modes for said specified wavelength range compared to the optical losses caused by said aperture layer alone, and

a radiation output window (44) formed above said first reflector or below said second reflector.

Whereby the vertical cavity surface emitting laser behavior is determined by the d_m interplay of at least two different design or characteristic dimensions and therefore a deviation of one parameter or dimension from a target value may not unduly compromise performance (inherent).

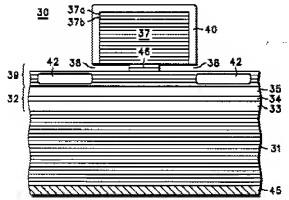

FIG. 2

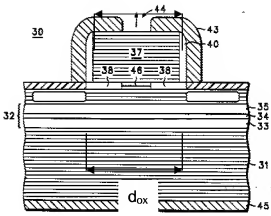

FIG. 3

Regarding **claim 2-3, 12-13,**

Note that SHIEH et al. discloses in figure 2, 3 and specification a third characteristic lateral size (see, 44, Mesa, and 42) (**claim 2**), a metal layer (43) (**claim 3**), a second reflector (31) comprising a plurality of doped layers having alternatively a low index of refraction and a high index of refraction (see, many lines) (**claim 12**), the configuration of a substrate (inherent to grow layers) and a metal layer (45) (**claim 13**),

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 4-11, 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over SHIEH et al. in view of Ueki (US 6816527).

Regarding **claim 4-8, 15-16,**

SHIEH et al. discloses the limitations of claim 1 for the reasons above.

However, SHIEH et al. is silent as to the different characteristic lateral sizes.

Ueki discloses the different aperture sizes depending upon the power and divergence angle (see, figure 4-8).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to combine the different aperture size of Ueki with a VCSEL of SHIEH et al. because these provides a VCSEL having mode control (see, col.5, lines 4-8 of Ueki).

Regarding **claim 9-11,**

A third plurality of doped layer disposed between the aperture layer and the second plurality of doped layer (**claim 9**) is obvious in this art to reduce the current spread and the number of doped layers (**claim10-11**) is obvious in this art since this depends on the reflectivity requirement of the application.

Regarding **claim 14**,

Note that Ueki discloses a contact layer (6, figure 1A) (**claim 14**).

7. Claim 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over SHIEH et al. in view of Sopra et al. (Pub No. 20020172247).

Regarding **claim 17-18,**

SHIEH et al. discloses the limitations of claim 1 for the reasons above.

However, SHIEH et al. is silent as to a phase matching layer.

Sopra et al. discloses the phase matching layer arranged within the resonator (see, Abstract).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to combine the phase matching layer of Sopra et al. with a VCSEL of SHIEH et al. because this provides a means to generate a reflectivity difference of the first and/or second reflector at a resonator region corresponding to the radiation emission window and the residual resonator region (see, paragraph [0009] of Sopra et al.).

Regarding **claim 19-22,**

Note that Sopra et al. discloses in figure 5a, 5b, 5c and specification the aperture having a circular shape (509) (**claim 19**), the radiation output window having a circular shape (508, in figure 5c) (**claim 20**), a non-circular shape (508, in figure 5a and 5b) (**claim 21, 22**).

Regarding **claim 23-29,**

Method **claims 23-28** are rejected for the same reasons applied above rejected apparatus claims 1-22 and process margin (**claim 29**) is obvious in this art since this has been well established in industry to accommodate the individual error of the component in manufacturing process.

Regarding **claim 30-31**

Device **claim 30** is rejected for the same reasons applied above rejected apparatus claims 1-22 except for a third plurality of doped layers. However, the layers can be interpreted as layers above the 42. Method **claim 31** is rejected for the same reasons applied above rejected apparatus claims 1-22 and claim 30.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Boucart et al. (US 6487230) discloses the vertical cavity apparatus with tunnel junction.

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kinam Park whose telephone number is (571) 270-1738. The examiner can normally be reached on from 9:00 AM-5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **MINSUN HARVEY**, can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/K. P./

Examiner, Art Unit 2828

/Minsun Harvey/

Supervisory Patent Examiner, Art Unit 2828